12. A set comprising the set of any of claims **1-11**, and further comprising the 43 RNA-coding genes of *Mycoplasma genitalium* , or functional equivalents thereof.

13. The set of any of claims **1-12**, wherein the genes constitute a chromosome.

14. The set of any of claims **1-13**, wherein the genes are from *Mycoplasma genitalium.*

15. A set comprising the set of any of claims **1-14**, and further comprising at least one gene involved in hydrogen or ethanol production.

16. The set of any of claims **1-15**, which are in a free-living organism.

17. The set of any of claims **1-15**, which are in a free-living organism that is growing and replicating in a rich bacterial culture medium.

18. The set of claim 17, wherein the rich bacterial culture medium is SP4.

19. The set of any of claims **1-15**, which are recorded on a computer readable medium.

20. A free-living organism that can grow and replicate under axenic conditions in a rich bacterial culture medium, whose set of genes consists of the set of any of claims **1-15**.

21. The free-living organism of claim 20, wherein the rich bacterial culture medium is SP4.

22. A method for determining the function of a gene, comprising inserting the gene into, mutating the gene in, or removing the gene from the free-living organism of claim 20 or 21, and measuring a property of the organism.

23. A free-living organism that comprises the set of claim 15.

24. A method of hydrogen or ethanol production, comprising growing the organism of claim 23 in a suitable medium such that hydrogen or ethanol is produced.

25. The set of any of claims **1-15**, wherein the genes constitute a library of DNA molecules.

26. A method comprising combining a plurality of DNA molecules to create the library of claim 25.

27. A method comprising combining all the DNA molecules of the library of claim 25 into an assembled DNA molecule.

28. The method of claim 27, wherein the assembled DNA molecule is a genome.

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